AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-15. Canceled.

16. (Currently Amended) A rock boring device comprising:

a boom having a proximal end and a distal end, the proximal end being pivotable about a first boom axis, wherein said boom is rotatable about a longitudinal axis of the boom;

a disc cutter pivotably mounted to the distal end of the boom to pivot about a wrist axis and structured to engage a rock face; and

an inertial reaction mass to stabilize the disc cutter; wherein said disc cutter is structured to be driven in an oscillating manner and movable in a nutating manner, the disc cutter configured to oscillate about an oscillation axis that is substantially perpendicular to the wrist axis, said disc cutter including a substantially continuous, circumferential cutting edge defining a leading tip and a trailing heel, the leading tip of the disc cutter being movable along a path that is substantially parallel to the rock face and substantially perpendicular to the oscillation axis to effect rock boring, the trailing heel of the disc cutter being spaced from said rock face during cutting.

17. (Previously Presented) A rock boring device as claimed in claim 16, wherein said disc cutter is free to rotate.

18. (Previously Presented) A rock boring device as claimed in claim 16, wherein said rock boring device includes a shaft comprising a driven section configured to rotate about a longitudinal rotation axis and a mounting section for mounting said disc cutter to said shaft on a mounting axis, and wherein said mounting axis is offset from the rotation axis of said driven section whereby said disc cutter will oscillate.

19. Canceled.

20. (Previously Presented) A rock boring device as claimed in claim 18 wherein said mounting axis is angularly offset from the rotation axis of said driven section by an angle greater than 0° and less than 10° whereby the disc cutter will nutate.

21-23. Canceled.

24. (Previously Presented) A rock boring device as claimed in claim 16, wherein said first boom axis is substantially vertical.

25-31. Canceled.

32. (Previously Presented) A rock boring device according to claim 16, wherein said disc cutter is driven in said nutating manner.

33. (Previously Presented) A rock boring device according to claim 16, wherein said disc cutter is driven in said oscillating manner and is free to nutate.

34-36. Canceled.

37. (Previously Presented) A rock boring device according to claim 16, wherein the cutting edge includes a plurality of cutting tips that are removably connected to the disc cutter.

38. (Previously Presented) A rock boring device according to claim 16, wherein the cutting edge includes a plurality of cutting tips that are permanently connected to or formed as part of the disc cutter.

39. (Previously Presented) A rock boring device according to claim 16, wherein the cutting edge includes a plurality of bits.

40. (Previously Presented) A rock boring device according to claim 16, wherein the cutting edge comprises a substantially continuous cutting ring.

41-44. Canceled.

45. (Previously Presented) A rock boring device according to claim 16, wherein the inertial reaction mass is annular and substantially surrounds the disc cutter.

46. (Currently Amended) A rock boring device as claimed in claim 16, wherein:

the boom is structured to pivot about the first boom axis to allow global pivoting of the combined boom and disc cutter, and

~~the boom is rotatable about a longitudinal axis of the boom, and~~

the disc cutter and the inertial reaction mass are structured to pivot about the wrist axis to allow local wrist-like pivoting movement of the disc cutter and the inertial reaction mass with respect to the distal end of the boom.

47. (Previously Presented) A rock boring device as claimed in claim 46, wherein the disc cutter is structured to pivot about the wrist axis in a first direction and the boom is structured to pivot about the first boom axis in a second direction, wherein the first and second directions are substantially the same just before the disc cutter engages the rock face.

48. Canceled.

49. (Previously Presented) A rock boring device as claimed in claim 16, wherein the inertial reaction mass is structured, in use, to counteract an impact force created upon impact with the rock face.

50. (Currently Amended) A rock boring device comprising:

a disc cutter structured to engage a rock face and an inertial reaction mass to stabilize the disc cutter; wherein said disc cutter is mounted on a shaft including a driven section having a first axis of rotation and a mounting section that supports the disc cutter for relative rotation

about a second axis of rotation that is offset from the first axis of rotation, so that the disc cutter is driveable in an oscillating manner and movable in a nutating manner; and

a boom to support the disc cutter, said boom being pivotable about a first boom axis so as to translate the disc cutter along a path that is generally parallel to the rock face, the disc cutter being mounted on said boom to pivot about a second boom axis that is substantially perpendicular with the first axis of the driven section, the disc cutter being maintained at a proper attitude relative to the rock face by pivoting of the disc cutter about the second boom axis in a direction that is opposite to a direction in which the boom pivots about the first boom axis during cutting, said disc cutter defining a substantially continuous circumferential cutting edge,

wherein the boom is structured to pivot about the first boom axis to allow global pivoting of the combined boom and disc cutter,

the boom is rotatable about a longitudinal axis of said boom, and

the disc cutter and the inertial reaction mass are structured to pivot about the second boom axis to allow local wrist-like pivoting movement of the disc cutter and the inertial reaction mass with respect to a distal end of the boom.

51. (Previously Presented) A rock boring device according to claim 50, wherein the disc cutter includes a tip to engage the rock face and a heel positioned opposite said tip, wherein the tip and heel of the disc cutter define with the rock face a non-zero rake angle such that the heel is positioned to avoid contact with the rock face.

52. (Previously Presented) A rock boring device according to claim 50, wherein the cutting edge includes a substantially continuous cutting ring formed on a larger diameter portion of a conic section.

53. (Previously Presented) A rock boring device according to claim 50, wherein the inertial reaction mass substantially surrounds the disc cutter and includes a plurality of stacked iron and lead plates coupled to pivot with the disc cutter about said second boom axis.

54-61. Canceled.

62. (Previously Presented) A rock boring device as claimed in claim 18, wherein said mounting axis is angularly offset from the axis of said driven section by an angle greater than 0° and less than 90° whereby said disc cutter will nutate.

63-66. Canceled.

67. (Previously Presented) A rock boring device according to claim 16, further including a shaft comprising a mounting section for mounting the disc cutter, the mounting section including a primary bearing substantially aligned with a load path of the disc cutter and a secondary bearing provided to preload the primary bearing.

68. (Previously Presented) A rock boring device according to claim 67, wherein a reaction force created by engagement of the rock face is substantially along the line extending through the primary and secondary bearings.

69-75. Canceled.

76. (Previously Presented) A rock boring device as claimed in claim 16, wherein a linear cutting velocity of said rotary disc cutter is controlled by interaction with a computer that processes algorithms with variable information input being provided by strain gauges and accelerometers mounted adjacent to said rotary disc cutter.

77. (Previously Presented) A rock boring device as claimed in claim 16, including means to reference the position of the machine with respect to the rock face, thereby allowing a predetermined depth of cut to be maintained at said rock face throughout a cutting cycle.

78-80. Canceled.

81. (Previously Presented) A rock boring device as claimed in claim 16, wherein the disc cutter is structured to move in a direction substantially along the rock face just before impacting a ledge protruding away from the rock face.

82. (Previously Presented) A rock boring device as claimed in claim 81, wherein the inertial reaction mass is structured, in use, to counteract an impact force created upon impact with the ledge.

83-86. Canceled.

87. (Previously Presented) A rock boring device as claimed in claim 16, wherein said boom is pivotable about a second boom axis at the proximal end, said second boom axis disposed generally orthogonal to said first boom axis.

88. (Previously Presented) A rock boring device as claimed in claim 16, wherein said first boom axis is substantially horizontal.

89. (New) A rock boring device comprising:

a disc cutter for engaging a rock face, said disc cutter including a substantially continuous, circumferential cutting edge positioned at a periphery of the disc cutter, wherein said disc cutter is arranged for nutation and rock cutting oscillation about an oscillation axis;

an inertial reaction mass to stabilize the disc cutter, said reaction mass being relatively large compared to the disc cutter, such that in operation, reactive cutting forces exerted by the rock face on the disc cutter in a generally radial direction are transmitted to and resisted by the inertial reaction mass thereby stabilizing the disc cutter during rock cutting;

a boom structured to pivot about a first boom axis to allow global pivoting of the combined boom and disc cutter, wherein the boom is rotatable about a longitudinal axis of said boom that is substantially transverse to or perpendicular to the first boom axis, and the disc cutter

and the inertial reaction mass are structured to pivot about a second boom axis to allow local wrist-like pivoting movement of the disc cutter and the inertial reaction mass with respect to a distal end of the boom.

90. (New) A rock boring device according to claim 89, wherein the inertial reaction mass is annular and substantially surrounds the disc cutter.

91. (New) A rock boring device according to claim 89, wherein the cutting edge includes a substantially continuous cutting ring formed on a larger diameter portion of a conic section.

92. (New) A rock boring device according to claim 89, wherein the oscillation axis is substantially normal to the disc.

93. (New) A rock boring device as claimed in claim 89, wherein said disc cutter is free to rotate.

94. (New) A rock boring device as claimed in claim 89, wherein said rock boring device includes a shaft comprising a driven section configured to rotate about a longitudinal rotation axis and a mounting section for mounting said disc cutter to said shaft on a mounting axis, and wherein said mounting axis is offset from the rotation axis of said driven section whereby said disc cutter will oscillate.

95. (New) A rock boring device as claimed in claim 94, wherein said mounting axis is angularly offset from the rotation axis of said driven section by an angle greater than 0° and less than 10° whereby the disc cutter will oscillate.

96. (New) A rock boring device according to claim 89, wherein said disc cutter is driven in said nutating manner.

97. (New) A rock boring device according to claim 89, wherein the disc cutter includes a tip to engage the rock face and heel positioned opposite said tip, wherein the tip and heel of the disc cutter define with ground a non-zero rake angle such that the heel is positioned to avoid contact with the rock face.

98. (New) A rock boring device according to claim 97, wherein the rake angle is variable.

99. (New) A rock boring device according to claim 89, further comprising a mounting section for the disc cutter, the mounting section including a primary bearing substantially aligned with a load path of the disc cutter and a secondary bearing provided to preload the primary bearing.

100. (New) A rock boring device according to claim 89, wherein a reaction force created by engagement of the rock face is substantially along the line extending through the primary and secondary bearings.

101. (New) A rock boring device as claimed in claim 89, wherein a linear cutting velocity of said rotary disc cutter is controlled by interaction with a computer that processes algorithms with variable information input being provided by strain gauges and accelerometers mounted adjacent to said rotary disc cutter.

102. (New) A rock boring device as claimed in claim 89, including means to reference the position of the machine with respect to the rock face, thereby allowing a predetermined depth of cut to be maintained at said rock face throughout a cutting cycle.

103. (New) The rock boring device as claimed in claim 102, wherein said machine is anchored with respect to said rock face thereby allowing a predetermined depth of cut to be maintained at said rock face throughout a cutting cycle.

104. (New) A rock boring device as claimed in claim 89, further comprising a boom structured to pivot about a first boom axis to allow global pivoting of the combined boom and disc cutter; and the disc cutter is structured to pivot about a second boom axis substantially perpendicular or transverse to the first boom axis, to allow local wrist-like pivoting movement of the disc cutter with respect to a distal end of the boom.

105. (New) A rock boring device as claimed in claim 104, wherein the disc cutter is structured to pivot about the second boom axis in a first direction and the boom is structured to pivot about the first boom axis in a second direction, wherein the first and second directions are substantially the same just before the disc cutter engages the rock face.

106. (New) A rock boring device as claimed in claim 89, wherein the disc cutter is structured to move in a direction substantially along the rock face just before impacting a ledge protruding away from the rock face.

107. (New) A rock boring device as claimed in claim 106, wherein the inertial reaction mass is structured, in use, to counteract an impact force created upon impact with the ledge.